Docket No.: 201163US2S

RCE

JFW

JUL 23 2004

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: Junichi ASADA
SERIAL NO: 09/740,902
FILED: RCE FILED: August 4, 2003
FOR: SEMICONDUCTOR DEVICE

GAU: 2815
EXAMINER: CHU, C. C.

REQUEST FOR CONTINUED EXAMINATION (RCE) TRANSMITTAL

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

This is a request for Continued Examination (RCE) under 37 C.F.R. §1.114 of the above-identified application.

Submission required under 37 C.F.R. §1.114

Previously Submitted:

- ☐ Consider the amendment(s)/reply under 37 C.F.R. §1.116 previously filed on
- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on

Enclosed:

- ■ Amendment/Reply
- ☐ Information Disclosure Statement (IDS)
- ☐ Other:

FEES	RATE	CALCULATIONS
☐ Suspension of action on the above-identified application is requested under 37 C.F.R. §1.103(c) for a period of months.	$130.00	$0.00
■ RCE Fee required under 37 C.F.R. §1.17(e)	$770.00	$770.00
☐		$0.00
☐		$0.00
TOTAL OF ABOVE CALCULATIONS:		$770.00
☐ REDUCTION BY 50% FOR FILING AS SMALL ENTITY		$0.00
TOTAL:		$770.00

☐ A check in the amount of _____ is enclosed

■ Credit card payment form is attached to cover the fees in the amount of $770.00

■ Please charge any additional Fees for the papers being filed herewith and for which no check or credit card payment is enclosed herewith, or credit any overpayment to Deposit Account No. 15-0030. A duplicate copy of this sheet is enclosed.

■ If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 CFR 1.136, and any additional fees required under 37 CFR 1.136 for any necessary extension of time may be charged to Deposit Account No. 15-0030. A duplicate of this sheet is enclosed.

07/26/2004 CNGUYEN 00000013 09740902
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Respectfully Submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.

Eckhard H. Kuesters
Registration No. 28,870

Customer Number
22850

Tel. (703) 413-3000
Fax. (703) 413-2220
I:\ATTY\RFF\20s\201163\201163-RCE3.DOC

DOCKET NO: 201163US2S

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF	:
JUNICHI ASADA	: EXAMINER: CHU, C. C.
SERIAL NO: 09/740,902	:
THIRD RCE FILED: HEREWITH	: GROUP ART UNIT: 2815
FOR: SEMICONDUCTOR DEVICE	:

AMENDMENT FILED CONCURRENTLY WITH
A REQUEST FOR CONTINUED EXAMINATION (RCE)

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

In response to the Office Action dated April 26, 2004, please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks begin on page 6 of this paper.

IN THE CLAIMS

Please amend the claims as follows:

Claims 1-27 (Canceled).

Claim 28 (Currently Amended): A semiconductor ~~memory device~~ apparatus comprising:

a semiconductor ~~element~~ device;

a plurality of lead wires connected to a plurality of connecting electrodes formed on said semiconductor ~~element~~ device;

at least a single dummy lead wire that is not electrically connected to said semiconductor ~~element~~ device and does not include an outer lead portion for electrically connecting said semiconductor ~~element~~ device to an external circuit of said semiconductor ~~element~~ device, a tip portion of said at least the single dummy lead wire extending over the semiconductor device;

an insulating film having an opening portion configured to accommodate said semiconductor ~~element~~ device and to support said plurality of lead wires connected to the plurality of connecting electrodes of the semiconductor ~~element~~ device and said at least the single dummy lead wire, said opening portion having a plurality of sides that define a perimeter of said opening portion; and

a resin molding configured to cover a connecting portion between tip portions of the plurality of lead wires and the plurality of connecting electrodes and [[a]] the tip portion of said at least the single dummy lead wire within the opening portion of said insulating film,

wherein said at least a single dummy lead wire is arranged in a space defined by two adjacent lead wires of said plurality of lead wires so that a length of said space is at least twice a minimum pitch between adjacent lead wires of said plurality of lead wires, the two

adjacent lead wires being provided on one side of said plurality of sides of the insulating film to define the space on the one side of the insulating film.

Claim 29 (Currently Amended): A semiconductor ~~memory device~~ apparatus comprising:

a semiconductor ~~element~~ device;

a plurality of lead wires connected to a plurality of connecting electrodes formed on said semiconductor ~~element~~ device;

at least a pair of dummy lead wires that are not electrically connected to said semiconductor ~~element~~ device and do not include an outer lead portion for electrically connecting said semiconductor ~~element~~ device to an external circuit of said semiconductor ~~element~~ device, tip portions of said at least the pair of dummy lead wires extending over the semiconductor device;

an insulating film having an opening portion configured to accommodate said semiconductor ~~element~~ device and to support said plurality of lead wires connected to the plurality of connecting electrodes of the semiconductor ~~element~~ device and said at least the pair of dummy lead wires, said opening portion having a plurality of sides that define a perimeter of said opening portion; and

a resin molding configured to cover a connecting portion between tip portions of the plurality of lead wires and the plurality of connecting electrodes and [[a]] the tip ~~portion~~ portions of said at least the pair of dummy lead wires within the opening portion of said insulating film,

wherein one and the other of said at least the pair of dummy lead wires are provided on one side and an opposite side of said plurality of sides of said insulating film, respectively, each of the one and the other of said at least the pair of dummy lead wires being arranged in

corresponding first and second spaces defined by first and second two adjacent lead wires of said plurality of lead wires, respectively, so that a length of each of said first and second spaces is at least twice a minimum pitch between adjacent lead wires of said plurality of lead wires, said first two adjacent lead wires being provided on said one side of said insulating film to define said first space on said one side of said insulating film, and said second two adjacent lead wires being provided on said opposite side of said insulating film to define said second space on said opposite side of said insulating film.

Claim 30 (Currently Amended): A semiconductor ~~memory device~~ apparatus according to claim 28, wherein a semiconductor chip in which the semiconductor ~~element~~ device is formed has a thickness of approximately 50 μm.

Claim 31 (Currently Amended): A semiconductor ~~memory device~~ apparatus according to claim 29, wherein a semiconductor chip in which the semiconductor ~~element~~ device is formed has a thickness of approximately 50 μm.

Claims 32-35 (Canceled).

Claim 36 (Currently Amended): A semiconductor ~~memory device~~ apparatus according to claim 28, wherein tip portions of at least two dummy wires extend over the semiconductor ~~element~~ device and the tip portions of the at least two dummy wires are connected to each other on the semiconductor ~~element~~ device.

Claim 37 (Currently Amended): A semiconductor ~~memory device~~ apparatus according to claim 29, wherein tip portions of the at least a pair of dummy wires extend over

the semiconductor ~~element~~ device and the tip portions of the at least a pair of dummy wires are connected to each other over the semiconductor ~~element~~ device.

REMARKS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 28-31, 36, and 37 are pending in the present application. Claims 28-31, 36, and 37 are amended and Claims 32-35 are canceled without prejudice by the present amendment.

In the outstanding Office Action, Claims 28 and 32 were rejected under 35 U.S.C. § 102(b) as anticipated by Sugano et al. (U.S. Patent No. 5,198,888, herein "Sugano"); Claims 29 and 33 were rejected under 35 U.S.C. § 103(a) as unpatentable over Sugano in view of Ito (U.S. Patent No. 6,104,083); Claim 30 was rejected under 35 U.S.C. § 103(a) as unpatentable over Sugano in view of Walter (U.S. Patent No. 4,770,640); Claim 31 was rejected under 35 U.S.C. § 103(a) as unpatentable over Sugano, Ito, and Walter; Claim 34 was rejected under 35 U.S.C. § 103(a) as unpatentable over Sugano in view of Hosomi et al. (U.S. Patent No. 5,825,081, herein "Hosomi"); Claim 35 was rejected under 35 U.S.C. § 103(a) as unpatentable over Sugano, Ito, and Hosomi; Claim 36 was rejected under 35 U.S.C. § 103(a) as unpatentable over Sugano in view of Lamson et al. (U.S. Patent No. 5,233,220, herein "Lamson"); and Claim 37 was rejected under 35 U.S.C. § 103(a) as unpatentable over Sugano, Ito, and Lamson.

Claims 28 and 32 were rejected under 35 U.S.C. § 102(b) as anticipated by Sugano. That rejection is respectfully traversed.

Independent Claim 28 is amended to replace the term "memory device" with the term "apparatus," the term "semiconductor element" with the term "semiconductor device," and to recite "a tip portion of said at least the single dummy lead wire extending over the semiconductor device." The claim amendments find support for example in Claim 34, which is now cancelled, and in Figure 2A. No new matter is believed to be added.

Briefly recapitulating, independent Claim 28 is directed to a semiconductor apparatus including a semiconductor device, a plurality of lead wires, at least a single dummy lead wire, an insulating film, and a resin molding. The plurality of lead wires are connected to a plurality of connecting electrodes formed on the semiconductor device, the at least a single dummy lead wire is not electrically connected to the semiconductor device, and a tip portion of the at least a single dummy lead wire extends over the semiconductor device. The insulating film has an opening portion configured to accommodate the semiconductor device and to support the plurality of lead wires and the at least a single dummy lead wire. The opening portion has a plurality of sides that define a perimeter of the opening portion. The resin molding is configured to cover (i) a connection portion between tip portions of the plurality of lead wires and the plurality of connecting electrodes and (ii) the tip portion of the at least a single dummy lead wire within the opening portion of the insulating film. The at least a single dummy lead wire is arranged in a space defined by two adjacent lead wires of the plurality of lead wires so that a length of that space is at least twice a minimum pitch between adjacent lead wires of the plurality of lead wires, and the two adjacent lead wires are provided on one side of the plurality of sides of the insulating film to define the space on the one side of the insulating film.

In a non-limiting example, Figure 2A shows the semiconductor device 11, the insulating film 12 having an opening portion, the plurality of lead wires 13, and the at least a single dummy lead wire 13' that extends over the semiconductor device 11.

The semiconductor apparatus of Claim 28 advantageously prevents a cracking of the resin molding because the at least a single dummy lead wire is arranged in a space defined by two adjacent lead wires and the tip portion of the dummy lead wire extends over the

semiconductor device such that a bonding strength between the semiconductor device and the resin molding is increased.[1]

Turning to the applied art, Sugano shows in Figure 6 a semiconductor device having a semiconductor chip 1a and a dummy lead wire 4a. However, the dummy lead wire 4a in Sugano does not extend over the semiconductor chip 1a as recited in amended Claim 28. Further, Sugano shows in Figure 16 a semiconductor device having a dummy lead 48d. However, the dummy lead 48d also does not extend over the semiconductor chip 1d. Similarly, Sugano shows in Figure 18 a semiconductor device having a dummy lead 69c that does not extend over the semiconductor chip 49c. Thus, Sugano does not teach or suggest the features of Claim 28.

Because amended Claim 28 recites features of Claim 34, which was rejected over Hosomi, Hosomi is discussed next. The outstanding Office Action asserts at page 8, lines 4-6, that Hosomi shows in Figure 11 a tip portion of at least a single dummy wire 70 extending over a semiconductor element 58. The outstanding Office Action further asserts at page 8, lines 6-8, that "it would have been obvious to one of ordinary skill in the art ... to modify Sugano et al. by using the tip portion of the at least a single dummy wire extending over the semiconductor element as taught by Hosomi et al."

Applicant respectfully submits that Hosomi shows in Figure 11 a dummy lead 70 formed outside corner leads 68 to prevent a deformation of the corner leads.[2] Hosomi specifically discloses that "inner leads **10** (hereinafter, referred to as the corner leads **10a**) closest to the corners of the device hole **4** are most liable to be deformed," and the corner leads 10a tend to bend toward the closest marks 12.[3] Thus, the structure of Hosomi is

[1] Specification, page 4, lines 13-18.
[2] Hosomi, Abstract, lines 1-3.
[3] Id., column 2, lines 10-15.

designed to overcome the disadvantages related to the corner leads.[4] Hosomi accomplishes this objective "by providing a tape carrier ... wherein dummy wiring members projecting into the opening are provided outside the ones of the wiring members closest to the corners of the opening at each side of the opening," as disclosed at column 2, line 63, to column 3, line 3. In summary, Hosomi specifically teaches providing a dummy lead ***outside*** the corner leads to prevent a deformation of the corner leads.

Therefore, if one of ordinary skill in the art would combine the teachings of Hosomi with the teachings of Sugano, the resultant structure would have the dummy lead ***only*** outside the corner leads, which is contrary to the features of Claim 28.

Furthermore, neither Sugano nor Hosomi teaches or suggests increasing a bonding strength between a semiconductor device and a resin molding so that a cracking of the resin molding is prevented.

Accordingly, it is respectfully submitted that independent Claim 28 and each of the claims depending therefrom patentably distinguish over Sugano and Hosomi, either alone or in combination.

Claims 29 and 33 were rejected under 35 U.S.C. § 103(a) as unpatentable over Sugano and Ito. That rejection is respectfully traversed.

Independent Claim 29 has been amended similar to independent Claim 28 and the claim amendments find support in Claim 35, which is now cancelled. Independent Claim 29 recites similar features as independent Claim 28 except that Claim 29 recites at least a pair of dummy lead wires placed opposite to each other instead of at least a single dummy lead wire. Further, Claim 29 recites that tip portions of the at least the pair of dummy lead wires extend over the semiconductor device.

[4] Id., column 2, lines 7-8.

The outstanding Office Action relies on Ito for teaching a pair of dummy wires placed opposite to each other. However, Ito does not cure the deficiencies of Sugano discussed above. Further, Hosomi also does not cure the deficiencies of Sugano and Ito.

Accordingly, it is respectfully submitted that independent Claim 29 and each of the claims depending therefrom patentably distinguish over Sugano, Ito, and Hosomi, either alone or in combination.

Claim 30 was rejected under 35 U.S.C. § 103(a) as unpatentable over Sugano in view of Walter. That rejection is respectfully traversed.

The outstanding Office Action relies on Walter for teaching a thickness of a semiconductor chip. However, Walter does not cure the deficiencies of Sugano. In addition, Claim 30 depends on Claim 28, which is believed to be allowable as noted above. Accordingly, it is respectfully submitted dependent Claim 30 is also allowable.

Claim 31 was rejected under 35 U.S.C. § 103(a) as unpatentable over Sugano, Ito, and Walter. That rejection is respectfully traversed.

None of Sugano, Ito, and Walter teaches or suggests the features of Claim 29. In addition, Claim 31 depends on Claim 29, which is believed to be allowable as noted above. Accordingly, it is respectfully submitted dependent Claim 31 is also allowable.

Claim 34 was rejected under 35 U.S.C. § 103(a) as unpatentable over Sugano in view of Hosomi. That rejection is moot because Claim 34 has been canceled.

Claim 35 was rejected under 35 U.S.C. § 103(a) as unpatentable over Sugano, Ito, and Hosomi. That rejection is moot because Claim 34 has been canceled.

Claim 36 was rejected under 35 U.S.C. § 103(a) as unpatentable over Sugano in view of Lamson. That rejection is respectfully traversed.

The outstanding Office Action relies on Lamson for teaching dummy wires connected to each other. However, Lamson does not teach or suggest dummy wires of a pair of dummy

wires provided on opposite sides of an opening portion and each of the dummy wires of the pair of dummy wires being arranged in corresponding first and second spaces defined by first and second two adjacent lead wires. Thus, Lamson does not cure the deficiencies of Sugano. In addition, Claim 36 depends from Claim 28, which is believed to be allowable as noted above. Accordingly, it is respectfully submitted dependent Claim 36 is also allowable.

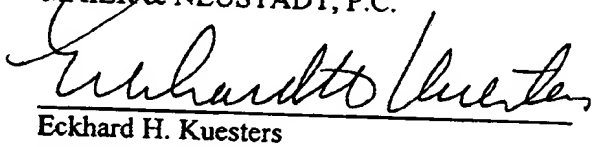
Claim 37 was rejected under 35 U.S.C. § 103(a) as unpatentable over Sugano, Ito, and Lamson. That rejection is respectfully traversed.

None of Sugano, Ito, and Lamson teaches or suggests the features of independent Claim 29. In addition, Claim 37 depends from independent Claim 29, which is believed to be allowable as noted above. Accordingly, it is respectfully submitted dependent Claim 37 is also allowable.

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Eckhard H. Kuesters
Attorney of Record
Registration No. 28,870

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 08/03)
EHK/RFF/ys

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